[redacted] ILLEGIB

Dear Dick:

Under the subtask entitled, "Refinement of Techniques", a recent investigation was performed to ascertain the qualities that an original negative must possess in order to properly simulate the parameters of the mission material by the GEMS technique. The key factor associated with the original negative is its processing. If it is desired to maintain both an adequate scene density range and high resolution in the simulation process, it is essential that the original negative be photographically processed to a gamma of unity.

The justification for the unity gamma processing can be described best by explaining the inadequacies of GEMS generated from higher gamma originals. The simulation procedure requires that a positive master transparency be generated with a cascaded gamma of unity. For an original negative with a gamma of 2.3, it is therefore necessary to process the master transparency to a gamma of 0.43. In the master reduction process, the 2.8 density range of the negative material is compressed to 0.84 density units. When these positive master transparencies are used to generate negative GEM PHOTOGRAPHS with a gamma of 2.3, the maximum density range that can be achieved is 1.45 density units. Under normal processing conditions for a gamma of 2.3 and with the proper exposure or scene illuminance, the mission material has a 2.6 to 2.8 density range capability.

When using a high gamma original negative, nothing can be done to match the density range of the GEM PHOTOGRAPHS with the mission material without detrimentally influencing some other photographic parameter in the simulation procedure. The low gamma processing of the master transparencies also limits the resolution capabilities of the GEMS.

Ideally, negative material, processed to a gamma of 1.0 and possessing a maximum density of 1.5 to 1.6, should be used when generating the master transparencies. We strongly urge that such negative material be obtained from the system designated as "B" Material along with a sensitometric step tablet. (All other parameters should be the same as for the material obtained previously.) The material is required by mid-December, at the latest, if it is to be used in generating the matrix GEMS. I feel that it is our duty to inform you that if such material is not employed in generating the masters, there is a very high probability that the mission material cannot be satisfactorily simulated.

Regards,

[redacted] STATINTL

Psychophysical Tests

Oct 31   3 T.I.D. people

6-8 week period ILLEGIB

[redacted]

to be finished by 12 Dec.

Objectives of P tests

(1) Scale (of ranking)

(2) consistency of ranking

(3) personnel differences.

(4) how well can mission material be evaluated w/ GEMS.

? of uniqueness — [redacted] STATINTL is looking at the problem